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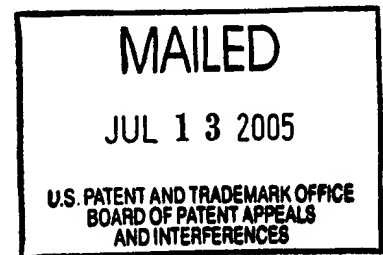
BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

JUL 04 2005
DIRECTOR OFFICE
TECHNOLOGY CENTER 2000

Ex parte TONIA G. MORRIS, KEVIN M. CONNOLLY, and LAWRENCE A. BOOTH, JR.

Appeal No. 2005-0439
Application No. 09/106,994

ON BRIEF



Before KRASS, BARRETT, and BARRY, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

A patent examiner rejected claims 1, 3-6, 8-10, and 18-28. The appellants appeal therefrom under 35 U.S.C. § 134(a). We affirm.

I. BACKGROUND

The invention at issue on appeal concerns an "imager." (Spec. at 1.) According to the appellants, a typical digital camera uses an imager to capture an optical image. For its part, the imager includes an array of photosensitive sensors. Each sensor measures the intensity of a portion, viz., a "pixel," of a representation of an image focused onto the array, (*id.*), and indicates an intensity of light of the pixel via an analog signal. The camera processes the indications from the sensors to form a frame of

digital data, which digitally represents the captured image, and transfers the frame to a computer for processing. (*Id.*)

The appellants further explains that a multi-color mosaic filter covers the array and configures each sensor to sense the intensity of one primary color of the associated pixel. For the set of red ("R"), green ("G"), and blue ("B") primary colors, the filter may cause each sensor to sense either a R, G, or B color of the pixel. The omitted primary colors are obtained through interpolation. Specifically, the missing primary color for a given pixel are derived by interpolating colors from the nearest pixels. If a given sensor senses only a G color of a pixel, for example, the R color for that pixel may be interpolated from data provided by neighboring sensors that sense R colors. Of course, the interpolation provides estimates, not the actual values, of the missing colors. (*Id.* at 2.)

In contrast, the appellants' digital camera includes an array of pixel sensors, a programmable color filter, a controller, and storage locations. Each sensor indicates at least two primary colors of an image focused onto the array. The programmable color filter substantially covers the array, and the controller programs the color filter to cause the pixel sensors to sense the primary colors one at a time. For each pixel

sensor, at least two of the storage locations are located in the array; these locations store the indications from the sensor. (*Id.* at 2-3.)

A further understanding of the invention can be achieved by reading the following claims.

1. An imager comprising:

an array of pixel sensors, each pixel sensor to indicate at least two different primary color components of an image;

for each pixel sensor, at least two storage locations located in the array to store the indications from the pixel sensor and each storage location being designated for a different one of the primary color components of the image; and

for each pixel sensor, circuitry to, during a first integration interval, couple the pixel sensor to one of the associated storage locations to store one of the indications from the sensor and, during a second integration interval, couple the pixel sensor to another one of the storage locations to store another one of the indications from the sensor.

22. An imager comprising:

an array of pixel sensors; and

at least two integration devices for each pixel sensor, each integration device being designated to provide a value for a different primary color.

23. The imager of claim 22, wherein each of said at least two storage locations are associated with different color components.

24. The imager of claim 22, wherein each of said at least two storage locations¹ are associated with different primary color components.

28. The method of claim 18, wherein said at least two storage locations comprise at least three storage locations for each pixel sensor.

Claims 1, 4, 6, 9, 18, 19, 21, and 22-28 stand rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,754,229 ("Elabd") and U.S. Patent No. 4,845,540 ("Baker"). Claims 3, 5, 8, 10, and 20 stand rejected under 35 U.S.C. § 103(a) as obvious over Elabd; Baker; and U.S. Patent No. 5,872,596 ("Yanai").

II. OPINION

Our opinion addresses the claims in the following order:

- claims 1, 3-6, 8-10, and 18-24
- claims 25-28.

A. CLAIMS 1, 3-6, 8-10, AND 18-24

"[T]o assure separate review by the Board of individual claims within each group of claims subject to a common ground of rejection, an appellant's brief to the Board

¹The limitation "said at least two storage locations" in dependent claims 23 and 24 appear to lack antecedent basis in claim 22, which recites no storage locations. Because there is no rejection for indefiniteness before us, however, we leave this matter to the examiner and the appellants.

must contain a clear statement for each rejection: (a) asserting that the patentability of claims within the group of claims subject to this rejection do not stand or fall together, and (b) identifying which individual claim or claims within the group are separately patentable and the reasons why the examiner's rejection should not be sustained."

In re McDaniel, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002) (citing 37 C.F.R. §1.192(c)(7) (2001)). "If the brief fails to meet either requirement, the Board is free to select a single claim from each group of claims subject to a common ground of rejection as representative of all claims in that group and to decide the appeal of that rejection based solely on the selected representative claim." *Id.*, 63 USPQ2d at 1465.

Here, the appellants stipulate that claims 1 and 4 "can be grouped together;" claims 6 and 9 "can be grouped together;" claims 18, 19, and 21 "can be grouped together;" and claims 22-24 "can be grouped together." (Appeal Br. at 12.) They further stipulate, "all claims of a particular group stand or fall together." (*Id.*) For our part, we select claims 1, 6, 18, and 22 from the respective groups as representative of the claims therein.

With this representation in mind, rather than reiterate the positions of the examiner or the appellants *in toto*, we focus on the point of contention therebetween.

The examiner makes the following findings.

Elabd shows an image sensor in Figure 3 with an array 480 of pixel sensors 484. Color filters 462 placed in wheel 460 (see Figure 2) are used in front of the image sensor (see column 4, lines 24-29) to allow each pixel sensor to capture and integrate the red, green, and blue components of an image individually (see column 4, lines 50-52). Array 480 also includes storage register 490 (see Figure 3) for separately storing the red, green, and blue charge packets integrated by the pixel sensors from successive color exposures (see column 5, lines 21-25).

(Examiner's Answer at 3-4.) The appellants argue, "the cited prior art does not teach or suggest primary color component designation for integrating storage devices."

(Reply Br. at 3.)

In addressing the point of contention, the Board conducts a two-step analysis. First, we construe the representative claims at issue to determine their scope. Second, we determine whether the construed claims would have been obvious.

1. Claim Construction

"Analysis begins with a key legal question — *what is the invention claimed?*"

Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). In answering the question, "[c]laims are not interpreted in a vacuum, but are

part of and are read in light of the specification." *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1116, 1 USPQ2d 1563, 1566 (Fed. Cir. 1987) (citing *Hybritech Inc. v. Monoclonal Anti-bodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1986); *In re Mattison*, 509 F.2d 563, 565, 184 USPQ 484, 486 (CCPA 1975)).

Here, claim 1 recites in pertinent part the following limitations:

storage locations located in the array to store the indications from the pixel sensor and each storage location being designated for a different one of the primary color components of the image; and

for each pixel sensor, circuitry to, during a first integration interval, couple the pixel sensor to one of the associated storage locations to store one of the indications from the sensor and, during a second integration interval, couple the pixel sensor to another one of the storage locations to store another one of the indications from the sensor.

Claims 6 and 18 recite similar limitations. For its part, claim 22 recites in pertinent part the following limitations: "at least two integration devices for each pixel sensor, each integration device being designated to provide a value for a different primary color."

The appellants' specification discloses that "to capture a multi-color image, the control unit 66 might first assert (drive high, for example) the SAMPR signal (at time T_0) to close the switch 73a. . . ." (Spec. at 6.) "The control unit 66 keeps the SAMPR signal asserted for an integration interval (called T_{11}) from time T_0 to time T_1 during

which the signal (a current signal, for example) from the node 91 is integrated by the storage unit 70a to form the stored red color value." (*Id.* at 6-7.) "Next, the control unit 66 . . . asserts the SAMP_G signal during another integration interval (called T_{12}) from time T_1 to time T_2 to store the green color value in the storage element 70b in a similar manner. The control unit 66 then . . . asserts the SAMP_B signal during another integration interval (called T_{13}) from time T_2 to time T_3 to store the blue color value in the storage unit 70c." (*Id.* at 6.)

Reading claims 1, 6, and 18 in light of the specification, the claimed "integration interval" is the time during which a switch is closed to transfer charges formed by a sensor to storage. Reading claim 22 in light of the specification, the claimed "integration device" is a storage to which charges formed by a sensor are transferred. By referring to storage capacitors 2a and 2b as "first and second charge-integration means 2a and 2b," col. 5, ll. 49-50, Baker confirms the reasonableness of our interpretation. Therefore, claims 1, 6, 18, and 22 require transferring charges formed by a photosensitive sensor to storage locations designated for different primary colors of an image.

2. Obviousness Determination

Having determined what subject matter is being claimed, the next inquiry is whether the subject matter would have been obvious. The question of obviousness is "based on underlying factual determinations including . . . what th[e] prior art teaches explicitly and inherently. . . ." *In re Zurko*, 258 F.3d 1379, 1383, 59 USPQ2d 1693, 1696 (Fed. Cir. 2001) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966); *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ 1614, 1616 (Fed. Cir. 1999); *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995)). "A *prima facie* case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, Elabd "is directed to image sensor devices. . . ." Col. 4, l. 29. In particular, "FIG. 3 is a block diagram of . . . a sensor device . . . utilizing a vertical interline transfer (IT) arrangement along with a color filter wheel." Col. 3, ll. 14-16. "[T]he device 480, as shown in FIG. 3, [features] . . . columns 482 of photosensitive charge-forming elements 484. . . ." Col. 5, ll. 15-17. Because "vertical CCD registers 488 . . . quickly transfer the charge from the associated columns 482 of

charge-forming elements 484 into the storage register 490," *id.* at ll. 19-21, we find that the reference transfers charges formed by photosensitive sensors to storage locations.

Furthermore, Elabd explains that "charge packets from successive color exposures may be stored in storage register 490 sequentially as shown in FIG. 3." *Id.* at ll. 21-23. Because Figure 3 of the reference shows that portions of the storage register 490 are designated for red ("R"), green ("G"), and blue ("B"), we further find that the reference teaches storage locations designated for different primary colors of an image.

Therefore, we affirm the obviousness rejection of claim 1; of claim 4, which falls therewith; of claim 6; of claim 9, which falls therewith; of claim 18; of claims 19 and 21, which fall therewith; of claim 22; and of claims 23 and 24, which fall therewith. In addressing claims 3, 5, 8, 10, and 20, the appellants rely on the same aforementioned argument, which we have found unpersuasive. (Appeal Br. at 8.) Therefore, we also affirm the obviousness rejection of claim 3, 5, 8, 10, and 20.

B. CLAIMS 26-28

The appellants stipulate, "claims 25-28 can be grouped together. With this grouping, all claims of a particular group stand or fall together." (Appeal Br. at 12.) For our part, we select claim 28 as representative of the claims therein.

The examiner finds, "Elabd teaches . . . separate red, green, and blue storage registers. . . ." (Examiner's Answer at 5.) The appellants argue, "neither of the arrangements that are disclosed in Baker teaches or suggests at least three storage locations for each pixel sensor. . . ." (Appeal Br. at 22.)

1. Claim Construction

"[T]he Board must give claims their broadest reasonable construction. . . ." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1668 (Fed. Cir. 2000). Here, claim 28 recites in pertinent part the following limitations: "said at least two storage locations comprise at least three storage locations for each pixel sensor." Giving the representative claim its broadest, reasonable construction, the limitations require at least three storage locations for a photosensitive sensor.

2. Obviousness Determination

"Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references." *In re Merck*, 800 F.2d, 1091, 1097, 231 USPQ 375, 380 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)). "Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *Cable Elec. Prods., Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1025, 226 USPQ 881, 886-87 (Fed. Cir. 1985) (quoting *Keller*, 642 F.2d at 425, 208 USPQ at 881).

Here, the rejection of claim 28 is based on a combination of reference that includes Elabd. As mentioned regarding claims 1, 4, 6, 9, 18, 19, 21, and 22-28, Figure 3 of the reference shows that portions of the storage register 490 are designated "R", "G", and "B." We find that these portions constitute three storage locations for a photosensitive sensor. Therefore, we affirm the obviousness rejection of claim 28 and of claims 25-27, which fall therewith.


III. CONCLUSION

In summary, the rejections of claims 1, 3-6, 8-10, and 18-28 under § 103(a) are affirmed. "Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences. . . ." 37 C.F.R.

§ 1.192(a). Accordingly, our affirmance is based only on the arguments made in the briefs. Any arguments or authorities omitted therefrom are neither before us nor at issue but are considered waived. *Cf. In re Watts*, 354 F.3d 1362, 1367, 69 USPQ2d 1453, 1457 (Fed. Cir. 2004) ("[I]t is important that the applicant challenging a decision not be permitted to raise arguments on appeal that were not presented to the Board.") No time for taking any action connected with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).


ERRYL A. KRASS)
Administrative Patent Judge)

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